

Thermal Renewable Energy Report

Executive Summary

In 2007, Governor Lynch signed HB873 into law, creating a Renewable Portfolio Standard (RPS) for suppliers of electricity in New Hampshire. The law also directed the Office of Energy and Planning (OEP) to study, evaluate and make recommendations on measures the state could implement to encourage greater use of thermal renewable energy. OEP convened a stakeholder committee, the Thermal Study Group (TSG), comprised of members from the utilities, renewable energy industry, state agencies, legislators and private citizens.

The TSG began by defining thermal energy and thermal renewable energy. Thermal energy refers to energy used to either regulate the temperature of an area or to create steam to power industrial machinery. Thermal renewable energy was defined as *“the control of heating or cooling through a system which uses energy from a sustainable source whose supplies are regenerative or essentially inexhaustible.”* Examples of thermal renewable energy sources include but are not limited to biomass, geothermal, solar thermal, passive solar, methane gas and biodiesel.

In 2006, 108.3 trillion British Thermal Units (BTU) or 32.3% of energy use in New Hampshire was for thermal purposes, making it the second highest energy use in the state. Renewable energy has supplied a smaller portion of the energy need, serving only 26.5 trillion Btu (7.9%) of the net energy use. However the social and economic benefits of renewable energy are creating an opportunity for further development of renewable energy. Specifically, there is a significant need and opportunity to increase the development of thermal renewable energy.

There are a number of barriers blocking the further development of thermal renewable energy. One chief concerns is the high upfront costs generally associated to install a thermal renewable energy system. Related to the cost of the systems is the accounting methodology used to value them. A smaller segment of the public includes the operational and maintenance costs into the value. If this accounting methodology, known as life cycle cost accounting, were to be used, thermal renewable energy systems would become more price-competitive to fossil fuel systems. Separate from the finances is the limited resources available to help educate consumers and heating, ventilation and air conditioning (HVAC) service providers about thermal renewable energy systems. Because the consumer is not asking for a thermal renewable energy system and the HVAC service provider is not offering the product, neither group is requesting the other for thermal renewable energy options. Instead, thermal renewable energy systems are being offered by a select group of specialized HVAC service providers. Finally, because these HVAC service providers are specialized, the geographic area these businesses service in New Hampshire is limited. The limited access to HVAC service providers for thermal renewable energy systems is causing many consumers to opt for fossil fuel systems that are offered more extensively in the state.

A provision in HB873 directed OEP to analyze the feasibility of a Thermal RPS, requiring a specified percentage of the thermal energy used in the state to come from renewable energy sources. The TSG found that at this time, it would be administratively impractical to implement a traditional RPS in the thermal industry because it is for the most part unregulated and decentralized with hundreds of retail fuel suppliers operating in New Hampshire. The cost to implant such a policy would be excessive.

The report recommends 6 actions for state and local governments to consider implementing to encourage greater use of thermal renewable energy resources. The recommendations were generated and vetted by the TSG, however, unanimous support for the recommendations was not achieved. A TSG member's participation in the process should not be construed as support for any specific recommendation.

1. Encourage and support thermal renewable energy projects with funding from the Greenhouse Gas Emissions Reduction Fund (GGERF):

Converting energy to heat is significantly more efficient than converting energy to electricity. Consistent with the Regional Green House Gas Initiative (RGGI) statute and recently adopted interim administrative rules, the Public Utilities Commission, to the extent possible, should use portions of the GGERF to encourage and support thermal renewable energy projects and infrastructure needs.

2. Increase educational efforts on thermal renewable energy systems:

Educational efforts are a required component to expand the use of thermal renewable energy systems. Efforts should focus on changing consumer behavior as well as career training for service providers. Educational resources should be focused to residential and business consumers, HVAC service providers, commercial trade organizations, municipal boards including local energy committees, architectural and construction professionals, and real estate professionals.

3. Establish a Thermal System Benefits Charge (SBC) to fund thermal renewable energy projects:

By 2010, the General Court should consider assessing a thermal SBC on all fossil fuels used for thermal applications. Funds generated from the proposed thermal SBC should be used to accelerate the adoption of thermal renewable energy technology in the residential, commercial, municipal, nonprofit and industrial sectors. The proposed thermal SBC would complement the existing SBC charge on natural gas, whose funds are used for thermal energy efficiency improvements.

4. Assess state and local regulations for barriers to thermal renewable energy systems:

State and local regulations should be assessed to identify regulatory barriers that may inhibit the further development of thermal renewable energy systems. A few suggested regulatory changes include:

- The Department of Labor should consider offering a waiver to thermal biomass boiler systems that are certified to European Union standards that meet American Society of Mechanical Engineer (ASME) standards but may not be "certified" by the ASME.
- In 2009, the General Court should consider forming a study commission to compare ASME standards on pressurized boiler systems against European Union standard EN 303-05. The comparison should focus on potential barriers in ASME standards towards thermal renewable energy systems and whether it can be adjusted to allow greater use of thermal renewable energy systems without compromising public health and safety.
- Road regulations designating oil delivery vehicles as "legal for trade" should be broadened to include wood pellet or chip delivery trucks.
- National Fire Protection Association (NFPA) guidelines should be reviewed to allow common flue connection for oil furnaces and pellet boilers.

5. Promote district heating and clarify hot water utility requirements:

District heating is generally more energy efficient because it utilizes a central common boiler system, thereby reducing operational and maintenance costs. There is a potential for thermal renewable energy, such as biomass, to serve as the fuel for district heating systems. The General Court should consider creating a study commission to assess the feasibility of developing district heating systems in New Hampshire, including capturing residual heat from electric generation facilities for district heating purposes. Additionally, the study commission should discuss whether PUC oversight is required for district heating companies that distribute heat via a low-pressure hot water system.

6. Standardize property tax exemptions for renewable energy systems:

In New Hampshire, municipalities are permitted to adopt policies that exempt the value of renewable energy systems from being included into the value of the property. However the implementation of these exemptions and the value associated to the renewable energy systems varies widely between municipalities. Some recommendations include:

- Assessing officials in cooperation with the New Hampshire Department of Revenue Administration and the New Hampshire Assessing Standards Board should standardize the procedure to assess the value a renewable energy system adds to a property's value.
- Municipalities should identify how renewable energy systems are calculated in their property assessments and if a value is included, the municipalities should consider adopting a property tax exemption for renewable energy systems, a power granted to them under RSA 72:61-72.
- The General Court should review the property tax exemption statutes for renewable energy systems (RSA 72:61-72) and make changes as appropriate.

Background

In 2007, HB873 was signed into law, creating a Renewable Portfolio Standard (RPS) that required specified percentages of electricity in the state be produced from various classes of renewable sources. The bill also directed the Office of Energy and Planning (OEP) to evaluate and recommend potential legislation to encourage thermal renewable energy. Specifically the law directed OEP to consider:

1. A Thermal RPS and other incentives or mechanisms that will promote the use of high efficiency, low emission thermal renewable energy technology and fuels in residential, commercial, and industrial applications.
2. Regulatory, technological, or other impediments to the rapid deployment of thermal renewable energy systems.
3. Recommendations to the state and local governments on programs and actions that can be implemented to encourage residential, commercial, and industrial use of thermal renewable energy.

The legislation further required OEP to report its findings to the legislature and governor on or before November 30, 2008.

In approaching these tasks, OEP initiated a collaborative process, involving a broad range of stakeholders, and formed the Thermal Study Group (TSG). The TSG was comprised of representatives from the utilities, renewable energy industry, nongovernmental organizations, trade associations, state agencies, legislators and concerned citizens. A full list of the members of the TSG is included as Appendix A. Between October 2007 and November 2008, the group met five times. Meetings were, publicly noticed and open to the public. OEP actively sought the opinions and concerns of all interested parties.

Two other initiatives relevant to this report are the 25x'25 Initiative, calling for 25% renewable energy in New Hampshire by the year 2025, and the Climate Change Task Force, charged with creating a Climate Change Action Plan to mitigate greenhouse gas emissions and adapt to the effects of climate change. These reports are being written concurrently. While the TSG report focuses on thermal renewable energy, the other two are broader in focus. The Climate Action Plan, as outlined in Executive Order 2007-3, entails a wide range of strategies pertinent to reducing greenhouse gas emissions including the expanded use of renewable energy and energy efficiency measures, development of public transportation and a philosophical change in land use planning policy aimed at reducing sprawling developmental patterns. The 25x'25 Initiative will focus on meeting 25% of New Hampshire's energy demand through renewable energy and energy efficiency across all sectors, including electric generation, thermal load of buildings and transportation. The recommendations of each report are inter related and complimentary.

Thermal Renewable Energy

Thermal energy refers to energy used to regulate the temperature of an area or to create steam to power industrial machinery. Fossil fuels including natural gas, heating oil, kerosene and propane are the traditional fuel sources used to power these systems. In 2006, New Hampshire's net energy consumption was 335.4 trillion British Thermal Units (BTU), with 108.3 trillion BTUs (32.3%) attributed to thermal uses, making it the second highest component of energy consumption in the state.¹ The electric and transportation industries constitute the remainder, at 122.8 trillion BTUs (36.6%) and 104.3 trillion BTUs (31.1%) respectively.²

Connected to the energy needs of New Hampshire is the country's heavy reliance on fossil fuels. In 2007, the US led the world in consumption of oil, consuming 24% of the global supply, while only supplying 10% of the global supply.³ As a result, the US is deeply dependent on foreign oil sources, which in 2006 accounted for 58% of the US consumption.⁴ This reliance on fossil fuel is posing a serious concern to the energy security of the nation. The concern becomes even graver when the vitality of the nation's economy and the environmental effects of burning fossil fuels are factored into the dilemma.

As lawmakers address these issues, renewable energy resources are progressively being discussed as a solution to diversify the country's fuel supply. In 2007 the state legislature focused on renewable energy in the electric industry, passing a Renewable Portfolio Standard (RPS) requiring

¹ New Hampshire Energy Facts, Office of Energy and Planning, May 20, 2008

² New Hampshire Energy Facts, Office of Energy and Planning, May 20, 2008

³ Energy Information Administration, *Energy in Brief: How Dependent are we on Foreign Oil?*, August 22, 2008

⁴ Energy Information Administration, *Energy in Brief: How Dependent are we on Foreign Oil?*, August 22, 2008

a percentage of electricity delivered in the state to come from various renewable resources. This report will focus on the opportunities to expand the thermal renewable energy resources in New Hampshire.

Beginning this explorative process, the TSG drafted a definition of thermal renewable energy. They defined it as *“the control of heating or cooling through a system which uses energy from a sustainable source whose supplies are regenerative or essentially inexhaustible.”* Examples include but are not limited to the following:

Air: Using a heat exchanger, the thermal energy stored in air is extracted to control a conditioned space.

Biomass: Wood products such as chips, pellets and cord wood; herbaceous energy crops such as switch grass or miscanthus; agricultural residues such as corn stover, or manure. Typical commercial and industrial installations involve boiler systems that transmit heat to its end use via hot water or steam distribution systems.

Geothermal: The ambient temperature of the ground is used to heat or cool a system. There are a variety of systems available but in general, a heat exchanger is used to extract heat that was collected via a looped system underground or underwater. The heat extracted from the heat exchanger is then transferred to an air or water system to distribute the heat throughout the building. Systems can be open looped, whereby they collect and discharge groundwater via a well, or closed loop, whereby a liquid filled tube is looped through the ground to collect the heat stored in the ground.

Solar (Thermal): Reflective panels focus the sun’s light onto tubes filled with a liquid. Heat collected in the liquid is pumped to a heat exchanger to heat a building or to supply hot water.

Solar (Passive): The collection of heat obtained through non-mechanical means by maximizing the exposure of the sun on the windows of a building.

Methane gas: Methane gas, produced by decomposing waste, is collected, filtered and processed before being burned in a boiler system. Sources of methane can include landfill waste, wastewater treatment facilities or byproducts from livestock.

Biodiesel: Through a process known as transesterification, an alcohol, typically methyl alcohol (methanol), is reacted with plant or animal fats. The reaction produces a methyl ester (“biodiesel”) and glycerin. The biodiesel can then be burned in a heating system.

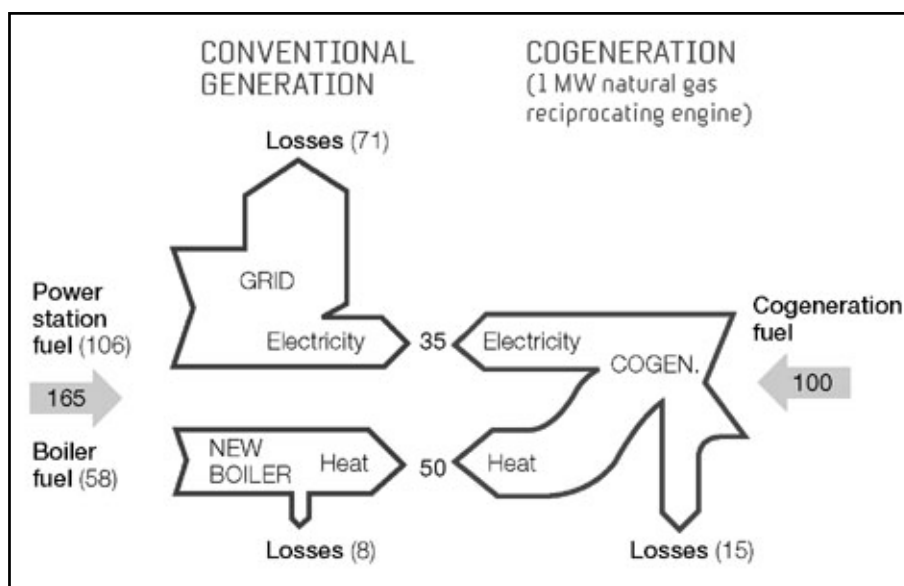
Encouraging thermal renewable energy development in the state will have both environmental and economic benefits. From an environmental perspective, expanding thermal renewable energy development will reduce pollutants responsible for climate change, poor air quality and health effects. This is exemplified in a 2007 report released by the Biodiesel Study Commission that researched the opportunities and impacts of expanding the biodiesel industry in New Hampshire. The report suggested the state could increase the gross domestic product by \$210 million, increase revenues by \$8.5 million and create 212 new jobs if New Hampshire converted 20% of the state’s diesel consumption to biodiesel products. Those that could benefit by encouraging thermal

renewable energy include the timber industry, trade and retail services, and manufacturing facilities.

Thermal systems have an additional benefit when the mechanical efficiencies of thermal energy production are compared to electric generation. In thermal heating systems, 80% of every unit of energy put into a mechanical system is converted to useable heat. In the most energy efficient boiler systems, the energy efficiency of the system can exceed 90%. Conversely in the generation of electricity, only 30% of the energy inputted is converted to useable electricity. The remaining energy is lost through the smoke stack or through transmission and distribution of the electricity. This becomes important when assessing how a limited renewable resource, such as wood, is best utilized. For example the RPS encourages wood fired electric generation but creates no incentive for the thermal application of wood products, which is more efficient.

District heating and cogeneration, while not directly related to thermal renewable energy, have the potential to expand the use of thermal renewable energy and are therefore included in this report. District heating is the ability to heat multiple structures within a region through a centralized heating system. The application of district heat is often used within school campuses, where a central boiler system supplies steam to heat all of the buildings on the campus. Cogeneration, also commonly referred to as combined heat and power (CHP), is the production of heat and electricity from the same fuel source and mechanical system. Cogeneration improves the overall efficiency of the heating system by collecting residual heat, not being used for thermal applications, and uses it to generate electricity. Similarly, residual heat from the generation of electricity can be collected and processed for thermal uses. Figure 1 demonstrates the general efficiency of cogeneration systems compared to conventional generation systems.

Figure 1
Cogeneration Flow Chart



Through a conventional system, two boilers are used; one for electric generation and one for heat. In this system it takes 165 units of energy to produce 35 units of electricity and 50 units of heat. This represents an average efficiency of 53%. Conversely, a cogeneration unit can produce the same amount of electricity and heat with only 100 units of energy, representing an average efficiency of 85%. Figure 1 is just one example of cogeneration and higher efficiencies are technically feasible.

Including district heating and cogeneration in this report highlights the potential thermal renewable resources have to serve as fuel to supply the demand for heat and electricity through a more efficient mechanical system. The relationship can best be explained by the efforts underway at the University of New Hampshire. Over the past 5 years, the university has built a central cogeneration plant to supply heat and electricity to the university. Beginning in 2009, a pipeline will deliver methane gas collected from a local landfill site to the cogeneration plant. The thermal renewable energy used at the cogeneration plant is expected to supply 85% of the energy needs of the university and reduce its carbon emissions by 57% below 1990 levels. This initiative at the University of New Hampshire serves as model for similar projects to be developed across the entire state of New Hampshire.

Thermal Renewable Portfolio Standard

HB873 directed OEP to analyze the feasibility of a thermal RPS. In general, an RPS creates a market for renewable energy by issuing a Renewable Energy Certificate (REC) for each megawatt (MW) of energy produced from a renewable resource. Traditional RPS policies focus on electricity produced from a renewable resource. These RECs are attached to the electricity but they are separate from the actual commodity, thereby allowing the REC to be bought and sold separately from the electricity. The demand for RECs is created by requiring a percentage of the electricity generated to come from a renewable energy source. In order to meet the requirement, electric delivery companies may choose to generate electricity from a renewable resource or purchase a REC. This drives the supply for renewable energy projects and creates an additional private funding mechanism to incent the production of renewable energy. A third option also exists if the price of a REC exceeds a threshold or if there are not enough RECs available in the market. In these two situations the electric delivery company may choose to pay into a public fund whose dollars are used to subsidize renewable energy applications. This structure protects the delivery company from excessive prices for RECs and also ensures renewable energy applications are developed in New Hampshire.

The TSG explored the feasibility of enacting a thermal RPS and concluded that at this time, a traditional RPS was not feasible. The main concern the group raised was the extensive administrative controls that would need to be implemented in an industry that is largely unregulated. The electric industry has 3 regulated electric utilities in the state, plus the New Hampshire Electric Cooperative, and a handful of municipal systems. The flow of electricity is highly regulated and measured. By contrast the thermal energy industry has numerous suppliers, distributors and retailers and there is no mechanism to track the quantity of fuel these businesses deliver. Because the fuel is not tracked, a REC cannot be attached to the fuel. Given the sheer number of service providers, it would be administratively difficult and costly to implement such a tracking system. Additionally there is a concern about what unit of measurement to use as a

constant for the thermal energy fuels that utilize a variety of measures. This issue is absent from the electric industry because the utilities measure their energy in kilowatt-hours (kwh). Comparatively, the thermal energy industry measures its energy in therms (natural gas), gallons (oil), and tons (wood pellets), among others. Because there is no single unit of measurement, it adds a level of complexity in allocating RECs equitably. In light of these concerns, the TSG concluded it would be administratively burdensome, expensive and impractical to impose an RPS standard in the thermal industry.

Market Impediments

The impediments of the expansion of thermal renewable energy systems in New Hampshire can be classified into four categories.

Cost:

Many thermal renewable energy systems have high upfront capital costs, primarily for two reasons. First, the actual mechanical system is often more expensive. Geothermal heat pumps are a good example, sometimes costing three times more than traditional natural gas or oil fired boiler systems. Second is the conversion costs sometimes required when upgrading older fossil fuel heating systems to new renewable fuel sources. Usually these costs lie in the conversion of the distribution of heat in the building. Steam radiated systems are a good example. They require larger pipes in order to deliver heat safely and efficiently throughout the building. If a geothermal heat pump were attached to this system, it would operate ineffectively because the volume of water that would be required to heat the building would be in excess of what the geothermal pump could generate. Therefore the entire building would require installation of a new heat delivery system if it were to install a geothermal heat pump.

Information:

There is a lack of information available to professionals in the HVAC industry and the consumers seeking HVAC products and services. HVAC vendors may not be knowledgeable on thermal renewable energy systems because customers are not requesting these services. At the same time, customers are not requesting these services because their primary mode of attaining information about heating/cooling systems is from the trusted opinion of the HVAC professional. As a result, the lack of knowledge from both parties serves as a barrier towards expanding the industry. Further, when individuals are determining the financial costs to install new systems, few people include the operational and maintenance costs over the lifespan of the device into the calculation. Life cycle cost accounting includes these costs and when it is employed, thermal renewable energy systems become more price-competitive to traditional fossil fuel based systems, due in part to the lower fuel costs.

Infrastructure:

Companies that service thermal renewable energy systems in New Hampshire are specialized and the availability of these services are not as extensive. Customers limited access to these companies for installation, maintenance and emergency service calls, is purported to be a reason why some do not invest in a thermal renewable system. Limited fuel delivery capabilities has also been a concern. While biomass is advancing in this regard, thermal renewable energies have not developed the ease of delivery and availability of more traditional home heating fuels.

Regulations:

As new markets open for thermal renewable energy products and services, regulations will need to be updated to ensure they do not impede its development. These regulations span both local and state levels and are described in greater detail in the Action Items.

Actions

There is an enormous need and opportunity for thermal renewable energy to displace a significant amount of traditional fossil fuel heating systems. Such change will bring both economic and environmental benefits to the State of New Hampshire. To encourage the development of thermal renewable energy, we recommend 6 actions.

Action 1: Encourage and support thermal renewable energy projects with funding from the Greenhouse Gas Emissions Reduction Fund (GGERF)

Barrier: The most significant barrier facing the expansion of thermal renewable energy is the upfront capital cost to install the systems.

Recommendation: To the extent possible, the Public Utilities Commission, with assistance from the Energy Efficiency and Sustainable Energy Board, should turn to the GGERF to encourage and support thermal renewable energy projects. Funding thermal renewable energy is a wise use of the GGERF, especially for limited renewable resources such as wood, because it is significantly more efficient to produce heat than it is to generate electricity. The funding should be made available to residents, businesses, nonprofits and municipal/state government.

Enacting Entity: Public Utilities Commission and Energy Efficiency and Sustainable Energy Board

Action 2: Increase thermal renewable energy education

Barrier: The expansion of thermal renewable energy systems is hindered by the lack of knowledge consumers and service providers have on thermal renewable energy. The relationship between the consumer and the heating ventilation and air conditioning (HVAC) service provider exemplifies the problem. Consumers interested in upgrading their HVAC system rely heavily on information from the HVAC service provider. Concurrently, the HVAC service providers use requests from customers to determine what services they will offer. Since consumers are not requesting thermal renewable energy systems and HVAC service providers are not offering them, the expansion of thermal renewables is hampered. In addition, many consumers use a traditional upfront capital cost accounting method versus a life cycle cost accounting method that includes operational and maintenance costs, thereby increasing the price-competitiveness of thermal renewable energy systems.

Recommendation: Education on thermal renewable energy should be expanded to consumers, HVAC service providers, municipal boards, real estate professionals and educational institutions. Additionally, educational efforts should target the numerous local energy committees forming in the towns and cities across the state. Such programs should include training programs for

established HVAC service providers, training programs at schools for the next generation of HVAC professionals, thermal renewable energy systems available for residential, commercial and industrial sectors, available resources from the state and federal government, and information on energy consumption of buildings.

Enacting Entity: Office of Energy and Planning, Public Utilities Commission, community colleges, universities, nonprofit organizations

Action 3: Establish a Thermal System Benefits Charge (SBC) to fund thermal renewable energy projects

Barrier: The importance of the high upfront capital cost to install a thermal renewable energy system warrants a second action.

Recommendation: By 2010, the General Court should consider adopting legislation to establish a thermal SBC on all fossil fuels used for thermal applications. Funding would be used to accelerate the adoption of thermal renewable energy projects and infrastructure. The proposed thermal SBC would complement the existing SBC charge on natural gas, whose funds are used for thermal energy efficiency improvements. The thermal SBC should be imposed on the wholesale purchase of fuel, similar to the road toll tax administered by the New Hampshire Department of Safety. With PUC oversight, funds should be made available to residents, businesses, nonprofits and municipal/state government.

The unit of measurement that will serve as a constant between the multiple fuels must be established. Unlike the electric industry, there are multiple measurements used in the delivery of fossil fuels, such as gallons for home heating oil and therms for natural gas. The carbon dioxide content of the fuels or its British Thermal Unit (BTU) output could be used as a constant measure. The highway tax on clean fuels in Maine uses the BTU content of the fuel in assessing the tax and it should be considered as a model in developing a thermal SBC in New Hampshire.

Enacting Entity: State Legislature

Action 4: Assess state and local regulations for barriers to thermal renewable energy systems

Barrier: Thermal renewable energies currently meet a small portion of the thermal needs in New Hampshire. As a result, state regulations on thermal systems have traditionally been focused on fossil fuels and have the potential to create barrier towards the further development of thermal renewable energy systems.

Recommendation: As the thermal renewable energy industry continues to grow, it will develop new products and infrastructures to deliver them. State and local regulations should be assessed to identify regulatory barriers that may inhibit the further development of thermal renewable energy systems. Solutions to the regulatory barriers may include increasing education efforts or may require amending the regulations through legislative or rulemaking procedures. A few suggested regulations include:

Department of Labor Waivers: To ensure the safety of the public, boiler systems, including biomass boilers, are required by the New Hampshire Department of Labor to be certified by the American Society of Mechanical Engineer (ASME) standards. A majority of commercial and industrial scale biomass boilers are constructed overseas and built to international standards. In many cases these standards are equivalent to or exceed ASME requirements. However because these systems are certified to international standards and in many cases are not “certified” to ASME standards, they cannot be installed in New Hampshire. For these systems to be installed, a waiver from the Department of Labor is required. The TSG recommends the Department of Labor to consider offering a waiver to thermal biomass boiler systems that are not “certified” to ASME standards but are constructed to and certified by European Union standard EN 303-05.

Wood Pellet and Chip “Legal for Trade” Standard: Traditional fuel delivery vehicles are required to meet weight and measure requirements imposed on them by Department of Transportation. Biomass products have not been included into these standards. As the market for bulk pellet and chip fuel grows, the weight and measures regulations should be adjusted to afford wood biomass delivery vehicles the same designation of “Legal for Trade”.

NFPA Guidelines on Common Flues: Currently National Fire Protection Association guidelines require separate flues for the effluent from pellet wood and oil combustion. Adjustments to NFPA guidelines allowing a common flue connection for pellet wood and oil fired boilers should be considered. Education should be provided to consumers on alternatives to venting pellet wood effluents through a second flue.

ASME Study Commission: A significant portion of Sweden, Germany and Austria are heated by biomass boiler systems and the European Union has issued strict regulations to ensure the safety of the public and a reduction in environmental pollution. In 2009, the General Court should consider drawing on the successful experiences of these countries and form a study commission to compare ASME standards with European Union standard EN 303-05.

Enacting Entity: Department of Labor, Department of Transportation, Department of Environmental Services, State Fire Marshall and State Legislature

Action 5: Promote district heating and clarify hot water utility requirements

Barrier: District heating generally increases energy efficiency by using a common central boiler system to deliver heat, thereby reducing operation and maintenance costs. District heating has an additional benefit if electricity providers were to capture residual heat from electric generation plants and distribute it to heat homes and businesses. The potential benefits are compounded further if thermal renewable energies, such as biomass, are used as the fuel source. New Hampshire’s experience in developing distributed heat is limited.

State statutes and PUC rules require companies that distribute heat via steam to be regulated by the PUC. However it is unclear whether companies that deliver heat via low-pressure hot water systems require regulation by the PUC.

Recommendation: The General Court should consider creating a study commission to assess the feasibility of developing district heating systems in New Hampshire, including capturing residual heat from electric generation facilities for district heating purposes. Additionally, the study commission should discuss whether PUC oversight is required for district heating companies that distribute heat via a low-pressure hot water system.

Enacting Entity: State Legislature, Public Utilities Commission

Action 6: Standardize property tax exemptions for renewable energy systems

Barrier: RSA 72:61-72 permits municipalities to adopt regulations allowing the value of a renewable energy system to be exempt from property assessments. The purpose of the regulation is to remove the financial disincentive caused by the increase a renewable energy system has on the property's value, without reducing the tax base of the community. Over 70 communities have adopted a renewable energy property tax exemption. However, there are concerns over the lack of a standard methodology tax assessors use to value a renewable energy system, or in some cases, the view that a renewable system does not enhance the value of the property.

Recommendation: Three recommendations should be considered:

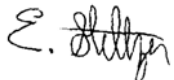
Standardize Valuation: Assessing officials in cooperation with the New Hampshire Department of Revenue Administration and the New Hampshire Assessing Standards Board should standardize the procedure to assess the value a renewable energy system adds to a property's value.

Municipal Action: Municipalities should identify how renewable energy systems are calculated in their property assessments. If a renewable energy system adds no value to the property, the municipality should take no action. If a value is attributed to the property for the renewable energy system, and the municipality has not adopted a property tax exemption for renewable energy systems, the municipality should consider adopting such measures.

Assess Property Tax Exemption Statutes: By 2010, the General Court should review the property tax exemption statutes for renewable energy systems (RSA 72:61-72) and make changes as appropriate.

Enacting Entity: Local municipalities, Office of Energy and Planning, State Legislature, Department of Revenue Administration, Assessing Standards Board

Submitted on behalf of Thermal Study Group,



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December 31, 2008

Appendix A: Thermal Study Group Participants

NAME	ORGANIZATION
Alan Belcher	ASME
Bill Gabler	Clean Power Development
The Honorable Charles Bass	Citizen
Charlie Niebling	New England Wood Pellet
Chris Sherman	New England Power Generation Association
Chris Skoglund	NH DES
Cindy Carroll	Unitil
Deb Hale	National Grid
Dick Henry	Jordan Institute
Don Everett	New England Geothermal
Donna Gamache	PSNH
Eric Steltzer	OEP
Heidi Kroll	GCG Law
Joe Broyles	OEP
Jack Ruderman	OEP
Jarrett Duncan	MGRM Law
Jasen Stock	NH Timberland Owners Association
Joanne Morin	NH DES
Joe Fontaine	NH DES
John Friede	Citizen
John Puc	National Grid
Keith Frieschlag	PSNH
Keith Woodard	Citizen
Mark Saltsman	Concord Steam
Mark Weissflog	NH Sustainable Energy Association
Peter Bloomfield	Concord Steam
Ray Angelone	Citizen
Shannon Hill	Simply Green
Stephen Frechette	Frechette Oil
Steve Eckberg	NH OCA
Steve Wingate	NH Timberland Owners Association
Suzanne Harvey	New Hampshire State Representative
Tim Roughan	National Grid
Tina Halfpenny	National Grid
Wendell Jesseman	New England Wire Technologies Corp

Appendix B: Meeting Agendas and Notes

Thermal Study Group Meeting Notes

Date: October 22, 2007

Location: OEP office

General Comments:

- Many expressed desire for a separate process from the 25 x '25 stakeholder process, although overlap was not seen as a detriment
- Would like to establish regular working group meetings
- Need to establish goal for thermal energy within overall 25 x '25 goal
- Need to establish small achievable goals

What is thermal energy?

- Process heat
- Space heating for residential, commercial and industrial sectors
- Hot water heating
- Space cooling

What qualifies?

- Solar
- Biodiesel
- Geothermal
- Biomass
- Combined heat and power

Questions to be considered?

- Can demand side management play a role?
- Can energy efficiency play a role? In what manner?
- Can hydrologic resources qualify

Process

- Goal is to develop incentives to increase the use of renewable resources in providing thermal energy
- Rank all applications in their ability to reduce imported fuels and reduce environmental impacts
- Need to develop monitoring and verification for the various applications or determine it is infeasible to monitor

Possible incentives to consider:

- White tags (RPS-like?)
- Carbon credits
- Procurement policies
- Rebates (e.g, via a systems benefits charge)

- Removing barriers (e.g., ASTM standards??)

Next steps:

- Establish regular working group meetings
- Develop some draft agendas for the first few meetings and circulate.

Thermal Renewable Study Group Meeting Agenda

Date: March 28, 2008

Time: 9:30AM to 11:30AM

Location: OEP office, 4 Chenell Drive, Concord [NOTE NEW LOCATION]

- I. Welcome and Introductions – Jack Ruderman, OEP / Joanne Morin, DES
- II. Meeting Objectives
 - A. To determine if the Thermal Study Group required by HB873 of 2007 can coordinate its work with a subgroup of the Climate Change Action Plan process
 - 1. Update the group on the CCAP process and progress
 - 2. Review timelines and deliverables
 - B. To reach tentative agreement on the definition of renewable thermal energy
 - C. To solicit feedback on the attached white paper proposing a Thermal RPS/SBC and discuss other initiatives
 - D. To establish a list of action items and responsible parties
- III. Review Agenda and Meeting Objectives
- IV. Overview of Status of Related Initiatives
 - A. 25 x '25
 - B. Coos County Economic Development
 - C. Renewable Portfolio Standard
 - D. Regional Greenhouse Gas Initiative
 - E. Climate Change Action Plan Task Force
- V. Discuss Definition of Renewable Thermal Energy
 - A. Fuel Types
 - 1. Solar (water and air)
 - 2. Biomass fueled combustion
 - 3. Ground Source Heat Pump
 - 4. Aquatic Source Heat Pump
 - 5. Methane
 - 6. Biologically derived liquids that cannot be burned in conventional equipment.
 - 7. Biodiesel and ethanol
 - B. Equipment types
 - C. Performance standard based on lifecycle analysis
- VI. White Paper Discussion – Charlie Niebling
- VII. Generate Other Initiatives to Consider
- VIII. Action Items
 - A. Determine parties responsible for the following

1. Defining regulatory or technological impediments to rapid deployment by fuel type/technology
 2. Developing draft state and local government programs and actions to encourage deployment
 3. Developing draft initiatives to encourage and promote thermal renewables.
- B. Set schedule for future meetings and deliverables

Attachments:

- The Charge of the Study Group
- Thermal RPS/SBC White Paper
- Renewable Thermal Definition.
- Overview of other initiatives (Excerpts from the Energy Universe)
- Climate Change Action Plan Residential Commercial and Industrial Working Group Objectives

Thermal Study Group Meeting Notes

March 28, 2008

Location: New Hampshire Office of Energy and Planning (OEP)

Participants:

Peter Bloomfield, Concord Steam

Joe Broyles, OEP

Steve Eckberg, NH Office of Consumer Advocate

Tom Franks, OEP

Keith Frieschlag, Unitil

Bill Gabler, Clean Power Development

Tina Halfpenny, National Grid

Dick Henry, The Jordan Institute

Wendell Jesseman, New England Wire Technologies Corp

Joanne Morin, NH Department of Environmental Services

Charlie Niebling, N.E. Wood Pellet

Jack Ruderman, OEP

Mark Saltsman, Concord Steam

Mark Weissflog, NH Sustainable Energy Association

Steve Wingate, NH Timberland Owners Association

Salient Points

I. Summary

A. Thermal renewable energy is defined based on inputs and outputs, regardless of intervening technologies.

B. While a thermal renewable portfolio standard may be unworkable, a clear and firm performance requirement is necessary and may properly be placed on the implementation program

C. A systems benefit charge levied on imported fossil fuels used to produce thermal energy will fund a program to increase the renewable energy component of New Hampshire's thermal energy requirements

II. Related Initiatives

A. In addition to the statewide initiatives distributed prior to the meeting information on the Coos County effort was provided. The Five Year Coos County Economic Action Plan is being developed with funding from US Commerce Economic Development Administration, NH Dept of Resources and Economic Development,, Tillotson Foundation, and the Community Development Finance Authority.

B. The North Country Resource Conservation & Development Renewable Energy Project is examining the costs, benefits and feasibility of extending steam and/or hot water from the proposed Groveton Renewable Energy Park (and other potential sources) into downtown Groveton as a model for identifying potential users, legal frameworks, infrastructure needs of biomass district energy systems funded by the

C. Public Utilities Commission has announced the creation of an Office of Sustainable Energy to focus on energy efficiency and renewable energy.

III. Definition of Thermal Renewable Energy

A. Thermal renewable energy has as its input a renewable energy source and as its output a change in the temperature of space, water, air or some other material for a useful purpose.

B. The group explored a variety of definitions looking at sources, technologies, and end uses and in the end determined to focus on inputs (sources) and end uses (outputs).

1. This definition is intended to allow for emerging and yet to be developed technologies.

C. The group further determined that the amount of program support (for example incentive payments) shall be related to efficiency and emissions standards.

D. The group also supported linking, but not mandating, program support to conservation and efficiency efforts. This might include:

1. A set aside for improvement in building lighting, shell and process energy usage.
2. Audit program linked to equipment incentives
3. Follow-up monitoring and verification

E. The group discussed municipal solid waste and determined that efficiency and emissions standards could address this issue.

IV. Policy Initiatives

A. The group discussed a thermal renewable portfolio standard (TRPS)

1. Challenging issues for this approach in this sector include

- a) the absence of a regulated industry
- b) a lack of a clear group of actors who hold a portfolio
- c) the administrative burden on multiple actors

2. The consensus appeared to be that while a strong driver is necessary, this mechanism may not be applicable to this sector.

B. The group discussed the system benefit charge (SBC) approach

1. Challenges for this approach include:

- a) incomplete data set for imported fossil fuels
 - (1) Propane, kerosene, and coal for residential use are not tracked at the state level.
 - (2) Fuel oil can be tracked through clean up fund payments.
- b) additional burden placed on already straitened small fuel dealers

2. The group discussed means of encouraging & supporting fossil fuel dealers to transform their business models to address carbon constrained economies. Absent participation from the sector, resolution was not reached.

3. The group determined that the SBS could appropriately be levied based on the relative carbon content of the fuel per unit energy. The group did not resolve the basis for the units (energy content, delivered energy, energy efficiency, etc).

4. The group determined that there should be some mechanism for ongoing evaluation.
5. The group determined that the implementing program shall have the responsibility for meeting the standards necessary to meet public policy goals, for example the 25% renewable thermal energy by 2025. It further determined that the funding levels and programs should be reviewed regularly in relation to performance efficiency and policy goals.
6. The group noted the need for outreach and education prior to and during implementation.
7. The group discussed some program design ideas including
 - a) incentives for capital costs, and letting savings support operations.
 - b) fuel production incentives, eg bio-liquids
 - c) incremental incentives for locally produced equipment
 - d) impact of potential federal policy or initiatives
 - e) means of engaging representative from the fossil fuel industry in program design.

Action Items:

- **Next Meeting:** Friday, April 18, 9:30 to Noon in the OEP conference room
- **Homework:** Each member of the group will consider regulatory issues that need to be addressed to implement a renewable thermal energy program.
- **Information Request:**
 - Notes from the thermal breakout group from last fall's 25 x '25 Conference.

[Available at http://www.nh.gov/oep/programs/25_x_25/development.htm]

 - Excerpts from the Final Report of the Commission to Study Production And Distribution Of Biodiesel In New Hampshire. [Attached]
- **Engagement:** OEP will seek to engage representatives from the fossil fuel industry in this process.
- **Coordination with the CCAPTF process:** There will be conference call of the RCI Thermal Subgroup on Monday, April 7. These minutes will be distributed to that group.

Thermal Renewable Study Group Meeting Agenda

Date: April 18, 2008

Time: 9:30AM to Noon

Location: OEP office, 4 Chenell Drive, Concord [NOTE NEW LOCATION]

- I. Introductions
- II. Meeting Objectives
 - A. To discuss and where possible reach consensus on specific policy issues
 - B. To establish a list of action items and responsible parties
- III. Review Agenda and Meeting Objectives
- IV. Report on Action Items from Last Meeting
 - A. Consolidate list of regulatory issues that need to be addressed to implement TSBC
 - B. Engage fossil fuel industry
- V. Policy Questions
 - A. Review and decide whether to adopt proposal on Thermal SBC for the Climate Change Action Plan (CCAP).
 1. CO2 Targets
 2. Funding levels
 3. Penetration levels
 - B. Shall fossil fuels used for combined heat and power systems (CHP) that would be eligible for incentives under the program be exempt from the levy?
 - C. Extent of market transformation efforts for existing fossil fuel industry
 1. Specific recommendations may be necessary since the TSBC may need to be enacted by statute
 2. Incentives supported by TSBC might include technical assistance; financing mechanisms such as grants, loans and loan guarantees; reduction of permitting and regulatory barriers; performance incentives; consumer education efforts; bulk purchasing support; and others.
 3. Compensation for collection of TSBC
 4. Is the TSBC a sufficient incentive for fossil fuel industry change?
 - D. Program design parameters
 1. What to incent – production, purchase, manufacturing, R&D of fuels and equipment?
 2. Adders for socially desirable attributes such as local production?
 3. Basis for levy – CO2/MMBTu delivered?
 4. Specify % for administration, monitoring, evaluation, and verification?
- VI. Proposed Action Items
 - A. Collect data for refining proposal to CCAP
 - B. Refine program design
 - C. Continue to solicit participation from fossil fuel industry

Attachments:

- Revised CCAP Action – Thermal System Benefit Charge

Thermal Study Group Meeting Notes

April 18, 2008

Location: New Hampshire Office of Energy and Planning (OEP)

Participants:

Charles F. Bass
Joe Broyles, OEP
Cindy Carroll, Unitol
Joe Fontaine, NH DES
Tom Franks, OEP
Bill Gabler, Clean Power Development
Deb Hale, National Grid
Dick Henry, The Jordan Institute
Joanne Morin, NH DES

Charlie Niebling, N.E. Wood Pellet
Jack Ruderman, OEP
Mark Saltsman, Concord Steam
Chris Skoglund, NH DES
Mark Weissflog, NH Sustainable Energy
Association
Steve Wingate, NH Timberland Owners
Association

Salient Points

- I. Summary
- II. Climate Change Action Plan Submission – The group discussed and determined additional data collection efforts to enhance the submission, as noted in items below.
- III. Reached consensus that fossil fuels used for CHP or systems eligible for incentives under this program should not be exempt from the levy.
- IV. With regard to market transformation of existing fossil fuel industry
 - a. Determined to make specific recommendation as to activities eligible for funding including but not limited to financing mechanisms such as grants, loans and loan guarantees; reduction of permitting and regulatory barriers; performance incentives; consumer education efforts; and bulk purchasing support for equipment and consumables.
 - b. Determined not to table discussion of compensation for collection of the levy
 - c. Anticipated that specific program design would be the responsibility of Public Utilities Commission rulemaking or equivalent.
- V. With regard to program design parameters
 - a. Reached consensus that the program should provide incentives for production, purchase, manufacturing and research and development of fuels and equipment.
 - b. Determined that the incentive program may be structured to provide a premium for socially desirable attributes such as local production, but excluded research and development from this premium.
 - c. Determined that the basis for the levy should be units of carbon dioxide equivalent per million British thermal unit delivered (ton CO₂e/ MMBtu) , or equivalent.
 - d. Determined not to specify limits for administrative activities including monitoring, evaluation, and verification.

- VI. Implementation Issues to Address
- VII. Boiler Certification Regulations
 - a. NH Dept of Labor (DOL) regulations make it difficult to use equipment that is not certified by the American Society of Mechanical Engineers. (ASME).
 - b. The Commissioner of DOL has the discretion to issue waivers of this requirement based on analysis
 - c. Equipment that is built to a higher standard and has safe track records in other countries but is not ASME certified would be beneficial in the market place.
 - d. Some manufacturers will be incurring the expense to achieve ASME certification.
 - e. In the interim, OEP will engage DOL on the issue of waivers for existing equipment.
- VIII. Property tax treatment
 - a. Only a few communities have exercised the option to exempt renewable energy systems from a properties assessment
 - b. However, appraisal methodologies have not captured the value of these systems due to a lack of comparative properties.
 - c. As the market matures, these systems may significantly increase the value of properties, and thus the tax base, and could conceivably absorb any potential cost savings from renewable energy
 - d. A uniform appraisal methodology would reduce uncertainty which is a barrier at this time.
- IX. Local ordinances preventing outdoor fuel storage
 - a. Silos and other storage systems which are necessary for the operation of some thermal renewable systems may be prohibited by local ordinance.
 - b. Uniform standards for appearance, placement, and other attributes may address some of these issues.
- X. Emissions regulations
 - a. House Bill 1405 – An Act Regulating Outdoor Wood-Fired Hydronic Heaters contains emissions standards that may address this issue
 - b. The legislature has exempted pellet boilers
 - c. Massachusetts may be on the verge of non-attainment status for PM2.5, which would have an impact.
 - d. This issue should be tracked.
- XI. Utility status
 - a. Transferring steam or hot water across a public roadway, depending on the number of customers served, may trigger treatment as a regulated utility
 - b. Recommend that this issue be reviewed for means to reduce the potential regulatory burden.
- XII. Wind siting barriers – May be resolved by HB310
- XIII. Geothermal loop requirements
 - a. Massachusetts had different regulations for open-loop and closed-loop systems.

- b. NH's regulatory standards need to be reviewed for barriers.

XIV. Review of the Thermal System Benefit Charge proposal to the Climate Change Action Plan Task Force

XV. Issues to address

- a. Assure that the program looks at the total life-cycle carbon emissions and life-cycle energy balance of measures and fuels.
- b. Assure that the program maintains the appropriate balance between encouraging renewable thermal systems and reducing carbon emissions
- c. Adjusting program revenues to reflect program success, that is, increasing or decreasing the levy based on program accomplishments.

XVI. Scope of opportunity

- a. Wood pellet potential
 - i. Approximately 256,000 NH homes (56%) heat with oil
 - ii. Oil, natural gas, and propane account for approximately 85% of home heating
 - iii. Average household consumes 3 tons per year of pellets
 - iv. The proposed plant in Berlin would produce 200,000 tons per year
 - v. Approximately one quarter of current homes using oil could be supplied by one plant of this scale
- b. Approximately 60-70% of NH's domestic hot water energy requirement could be met by solar hot water systems
- c. 80-85% of NH schools heat with oil
- d. Commercial and industrial space, water and process heat is a large user of fossil fuels.

XVII. Sources for refining opportunity and goals

- a. Oil discharge fund to capture totals of oil sold
- b. Air permits for C&I emitters from DES data
- c. DOL boiler data
- d. Underground storage tank data from DES

XVIII. Action Items

- a. Joanne Morin will investigate acquiring data from DES sources**
- b. Mark Saltsman will investigate acquiring data on C&I boilers from DOL sources**
- c. Deb Hale will investigate acquiring data on asphalt plant energy use**

XIX. Additional Action Items

- a. OEP will engage with DOL on the issue of equipment waivers**
- b. OEP will continue effort to engage current fossil fuel industry**
- c. Next meeting set for May 22, 9:30AM to NOON at the OEP office**

Thermal Renewable Study Group Meeting Agenda

Date: September 9, 2008
Time: 1:30PM to 3:30PM
Location: OEP office, 4 Chenell Drive, Concord

- I. Welcome and Introductions – Jack Ruderman, OEP / Joanne Morin, DES
- II. Meeting Objectives
- III. Overview Thermal Energy Definition
- IV. Outline Scope of the Report, relation to Climate Action Plan
- V. Discuss Action Items/Recommendations
- VI. Next Step:
 - a. Draft of report by end of September
 - b. Meeting to go over draft first half of October
 - c. Final Draft by beginning of November
 - d. Meeting to approve final draft by middle of November
- VII. Schedule next meeting
- VIII. Adjourn

Thermal Study Group Meeting Notes

September 9th, 2008

Location: New Hampshire Office of Energy and Planning (OEP)

Participants:

Jack Ruderman, OEP
Eric Steltzer, OEP
Mark Saltsman, Concord Steam
Jasen Stock, NHTOA
Bill Gabler, Clean Power Dev.
Charlie Niebling, N.E. Wood Pellet
Mark Weissflog, KW Management

Dick Henry, Jordan Institute
Chris Skoglund, DES
Joanne Morin, DES
John Puc, National Grid
Deb Hale, National Grid
Wendell Jesseman, N.E. Wire

Salient Points

- I. Overview of Thermal Definition:
 - a. Thermal renewable energy shall be defined as follows:
- II. “Thermal renewable energy is the control of heating or cooling through a system which uses energy from a sustainable source whose supplies are regenerative or essentially inexhaustible.”
 - a. Examples of thermal renewable energy shall include but not be limited to biomass, geothermal (land and water), solar (thermal and passive), methane and biodiesel. Future technological advancements may find new sources of renewable energy for thermal applications.
- III. Scope of Report and relation to Climate Action Plan
 - a. The Climate Action Plan will be broader, focusing on CO2 reductions as a whole. The thermal applications of renewable energy will be glanced over, allowing the Thermal Energy Report to focus in on the topic in greater detail, as defined in HB873.
 - b. While not inherent in the scope of the report, the efficient use of renewable energy sources should be emphasized. Specifically the possibilities of biomass and geothermal sources for combined heat/power and district heating applications. “Thermal renewable energy should be developed in an efficient manner that is technologically feasible.”
 - c. Lifecycle analysis helps to support the development of thermal renewable energy systems.
- IV. Discussion on Action Items:
- V. It is easier to remove barriers than create incentives.
- VI. Plan should consider recommending a set percent of renewable energy used for thermal use within a given time period. Ideas were discussed to be at least 25%, possibly more, by the year 2025.
 - a. Thermal RPS:

- i. Group consensus that a traditional RPS is not administratively feasible because:
 - 1. The market is largely unregulated (difficulty to monitor)
 - 2. The global influence adds a layer of complexity (no trading platform)
 - 3. These two issues would increase the costs of implementation
- b. Thermal Systems Benefit Charge:
 - i. Administratively possible because fuel is measured.
 - ii. Report should mention the current SBC charge on natural gas. Further review of how and to what proportion this SBC charge is being use to encourage thermal renewable energy systems specifically.
- c. DOL waiver requests:
 - i. Word this broadly, similar to the Maine Biomass Report (pg. 24), to allow for additional regulation changes, including but not limited to DOL Waivers.
 - ii. Biomass systems are being created that are more stringent than ASME standards.
 - iii. There are no international standards. However there are more progressive standards in European countries.
 - iv. Equipment which exceeds ASME standards should receive DOL waivers.
 - v. Action: DOL should loosen their requirements for ASME standards, permitting waivers to those systems that maintain public safety and are more stringent than ASME standards.
- d. Property Tax Treatment:
 - i. There are inconsistencies in valuation of renewable systems. Some professionals in the real estate industry view it as a detriment, others a positive.
 - ii. Few towns have implemented property tax exemptions. The mechanism and value of the exemption should remain in the municipality's control.
 - iii. Action: Improve the consistency by real estate industry (assessors, bank valuations, agents) in assessing the value of renewable systems into property values.
 - iv. Action: Enhance educational efforts about the option municipalities have to implement a property tax exemption on renewable energy systems.
- e. Local Ordinance Definition and support:
 - i. Highlight how HB310 changed municipal zoning power.
 - ii. Action: Educate planning boards and municipal officials about changes to the statutes pertaining to unreasonable limitations and interpretations of zoning regulations.
- f. Emissions Regulations:

- i. HB1405 was signed regulating emission requirements on outdoor wood fired hydronic systems.
 - ii. Action: Monitor the effect HB1405 has in regulating emissions and how the market reacts to the adjustment.
- g. Utility status for district heating with hot water:
 - i. It is unclear whether a utility, regulated by the PUC, is required to distribute hot water for the purpose of thermal applications.
 - ii. Action: The state general court should adopt legislation which states that a utility, regulated by the PUC, is not required for companies interested in distributing hot water for thermal applications.
- h. Geothermal Loop Requirements:
 - i. Mark Weissflog will research geothermal loop requirements in New Hampshire to identify if they need to be adjusted.
- i. Educational Campaign:
 - i. Audience should include real estate industry (assessors, bank valuers, realtors), planning boards, municipal officials, HVAC technicians, among others.
 - ii. Focus on planning changes, opportunity for district heating operations from Electric Generation Facilities and mechanical systems for HVAC.

VII. Next Steps

- a. **Eric Steltzer will draft report for beginning of October.**
- b. **Bill Gabler will send Eric information for action item on utility regulation of hot water.**
- c. **Mark Weissflog will get Eric information for action item on geothermal loop requirements.**
- d. **Group will identify statutes which create barriers towards development of thermal renewable energy.**
- e. **Next meeting will be scheduled for first half of October. Notice forthcoming.**

Thermal Renewable Study Group Meeting Agenda

Date: December 17, 2008
Time: 1:30PM to 3:30PM
Location: OEP office, 4 Chenell Drive, Concord

- I. Welcome and Introductions – Eric Steltzer, OEP
- II. Meeting Objectives
- III. Review written comments and discuss report
- IV. Next Steps- Final Report out by December 31st.
- V. Adjourn

Thermal Study Group Meeting Notes December 19th, 2008

Location: New Hampshire Office of Energy and Planning (OEP)

Participants:

Eric Steltzer, OEP
Joe Broyles, OEP
Mark Saltsman, Concord Steam
John Puc, National Grid
Wendell Jesseman, N.E. Wire
Steve Eckberg, Office of Consumer Advocate

Summary of Changes to Thermal Renewable Energy Report

The Thermal Study Group meeting on Friday December 19, 2008 focused on the 9 proposed action items. Comments included below are categorized by action item listed in the Executive Summary:

Action 1: Allocate RGGI funding to thermal renewable energy

- Concerns with the word allocated. The intention of the action will be changed to “encourage” and “support”.
- Concern with RGGI funds going towards thermal renewable energy. There is a great deal of confusion about this and the matter hasn’t been decided. In light of PUC official ruling, the language in the state be less forward. Will include language such as “To the extent possible” or “Subject to PUC ruling”.

Action 2: Establish a Thermal System Benefits Charge

- Awaiting position from National Grid.
- Direction group is leaning towards is to stress the purpose of a thermal SBC is to fund thermal renewable energy.
- Add in sentence or two describing current SBC charge on natural gas and how it is used for energy efficiency (with one program by National Grid focused on Solar Thermal).

Action 3: Increase education efforts on thermal renewable energy

- Will stress education to Local Energy Committees and the efforts being undertaken by these local boards
- Will include PUC as enacting entity. It was recognized that they will not “implement” a program per se but the will be a partner in providing input.

Action 4: Assess state and local regulations

- Beginning will stress the need research and education so people know what the specific issues are with thermal renewables. In many cases simply educating people about the thermal renewable energy system installation will help to reduce the barriers imposed by some regulations. (ie. Pellet stoves can be vented through a exterior wall rather than through a chimney vent)
- Bullet item 1,3,4 will be clumped together and fall underneath barriers.
- Bullet item 1 will recommend the DOL consider recognizing other standards that meet ASME standards but may not be certified to ASME standards.
- Bullet item 2 will be on it's own and emphasized.
- Bulleted item 2 will be expanded to include commercial boilers and industrial.
- Need clarification from Charlie about what specific standards these systems are being certified underneath. Is it Swedish, German, European, International?
- Bullet item 3 will be adjusted to suggest the General Court to consider creating a study commission
- Bullet item 4 will be adjusted to suggest NFPA guidelines be reviewed to see if flue standards need to be adjusted to allow common flue for two effluents.
- Will clarify if the NFPA guidelines are focused on pellet stoves or pellet boilers.

Action 5: Expand RPS to include cogeneration and clarify interconnection issues

- This is a new action never discussed by the group. Should it be included?
- Clarify that cogeneration means one mechanical system that produces both heat and electricity. (There was concern that some people consider the recovery of residual heat from an electric generator to produce extra electricity may be considered cogeneration). Mention connection to CHP.
- Concern that this policy is less related to thermal renewable energy and more related to energy efficiency and grid stability.

Action 6: Standardize property tax exemptions for renewable energy systems

- Replace real estate industry with DRA.
- Add a recommendation for the General Court to review and consider adjustments to the property tax exemption statutes.

Action 7: Require Green Building Standards on publicly funded projects

- This is a new action and has never been discussed by the group. Should it be included?
- The sentiment is that while the issue and policy is important, the report might not be the right forum to raise the discussion. The policy has less to do with thermal renewable energy and more to do with energy efficiency.

Action 8: Support local ordinances for renewable energy and monitor air emissions

- Considering striking this entire action.

- Public educational support to LEC should be focused in action item 3. This will take away the request to support local community adoption of ordinances supporting renewable energy.
- Air emissions (quality) is a concern already being addressed by DES. They are already monitoring the situation and no real action would be requested of DES.

Action 9: Clarify hot water utility requirements and promote district heating

- Clarify statements on the greater efficiency of common boiler systems. Speak about it in “general” terms.

Other changes:

- Action Items 10 and 11 were suggestions for inclusion. They have not been expanded on and would require substantial discussions before they could be included. Given these reasons, they will be removed.